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LE, LANA N	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/856,746	VAISANEN ET AL.	
	Examiner	Art Unit	
	Lana N. Le	2685	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2 and 12 is objected to because of the following informalities:

- in claim 2, lines 11-12, "the digital baseband quadrature signal" should be "the analog baseband quadrature signal" and same for line 12;
- in claim 12, line 9, after "signal", "to" should be added;
- in claim 12, line 11, "baseband transmission signal" should be "analog baseband transmission signal";
- in claim 12, line 16, "baseband transmission signal" should be "analog baseband transmission signal". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3-4, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) and further in view of Smith et al (US 5,796,772).

Regarding claim 1, Isberg et al discloses a method for processing signals received from different radio interfaces of communication systems, (i.e. DCS and PCS; col 2, lines 13-16; col 4, lines 61-66), comprising steps in which:

steps in which a carrier frequency signal is received via antenna 10 (col 4, lines 61-66) from a radio interface of a system on one of a plurality of frequency bands (i.e. GSM; fig. 5; col 2, lines 15-16);

the signal at the carrier frequency is bandpass filtered via 12a, 12b, 12c (fig. 5 and hereafter; col 5, lines 1-3);

the filtered signal at the carrier frequency is amplified via 34a, 34b, 34d or via a common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36 (col 5, lines 8-10; col 5, lines 18-21);

a RX mixing signal at the receive frequency is generated at numeral characters 36a, 36, 38, and reference character QUAD (col 5, lines 8-12),

a complex baseband signal (I, Q) is generated (via 40a, 41a, 40, 41) from the received carrier frequency signal by mixing it with the RX mixing signal (col 5, lines 6-8, col 5, lines 12-15),

the baseband signal (I, Q) generated is low-pass filtered (via 42a, 42b) (col 5, lines 11-14),

and the baseband signal is processed (via reference character block Baseband Processing) so as to produce an information signal encoded and modulated into the received carrier-frequency signal (at the output of the reference character block Baseband Processing),

wherein the amplifying of the carrier frequency signal is performed with one and same amplifier for signals received from at least two different radio interfaces (fig. 5 can share the common low noise amplifier in place of amplifiers 34b and 34d as a modified embodiment; see col 5, lines 18-32).

- the generating of the complex baseband signal is performed with one and same mixer (in phase and quadrature mixers 40, 41; fig. 5) for signals received from at least two different radio interfaces (different radio interfaces of different communication systems DCS and PCS) (col 5, lines 7-19).

However, Isberg et al fail to further disclose:

the baseband signal generated is amplified or attenuated prior to analog to digital conversion; the baseband signal is converted to digital and is processed to produce an information signal encoded and modulated into the receive carrier frequency signal; and the bandpass-filtering is performed using a pass band, which is tunable or adjustable by means of programming.

Auvray discloses a baseband signal processing technique in dual-mode (col 4, lines 38-41) in which the baseband signal (232I, 232Q) is amplified or attenuated (via amplifiers 234i and 234Q; fig. 2 and hereafter; col 5, lines 33-36) prior to analog to digital conversion; the baseband signal is converted to digital (via A/Ns 235I, 235Q; col 5, lines 33-37) and is processed (via DSP1 24) to produce an information signal 23 encoded and modulated into the received carrier-frequency signal (col 5, lines 38-41). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the baseband signal amplified prior to analog to digital conversion

and processed in order to strengthen the baseband signal and to have a device that's capable of converting the received analog signal to digital so that the signal is convertable to a suitable binary code format to represent information suitable for further digital channel decoding and demodulation as suggested by Auvray (col 5, lines 38-41).

Isberg et al and Auvray do not disclose:

the bandpass-filtering is performed using a pass band, which is tunable or adjustable by means of programming. Smith et al disclose the bandpass-filtering (via 117; fig. 3) is performed using a pass band, which is tunable or adjustable by means of programming (col 7, lines 14-17, lines 43-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the bandpass filter of Isberg et al for the tunable bandpass filter of Smith et al in order to allow the modified receiver system of Isberg et al and Auvray to reduce and simplify the circuitry components with one common bandpass filter to adjust the filter to a narrow or wide bandwidth and corresponding frequency based on the particular frequency mode in operation as suggested by Smith et al (col 7, lines 43-50).

Regarding claim 3, Isberg et al disclose a direct-conversion receiver (fig. 5 and hereafter; col 2, lines 7-12) operating at different radio interfaces of different communication systems (i.e. DCS and PCS; col 2, lines 13-16; col 4, lines 61-66), further comprising:

antenna means (10; col 2, lines 66-67) for receiving a carrier-frequency signal from a radio interface on one of a plurality of frequency bands (col 2, lines 15-16);

bandpass filter (12a, 12b, 12c) for filtering the carrier frequency signal (col 5, lines 1-3);

first receiver amplifier (34a, 34b, 34d) or via a common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36 for amplifying the filtered carrier-frequency signal (col 5, lines 8-10; col 5, lines 18-21);

means (36, 36a, 38, and reference character QUAD) for generating an RX mixing signal at the receive frequency (col 5, lines 8-12);

mixing means (40a, 41a, 40b, 41b) for generating a complex baseband signal I, Q from the received signal by means of the RX mixing signal (col 5, lines 12-15; col 5, lines 6-8);

low-pass filter (42a, 42b) for filtering the baseband signal I, Q (col 5, lines 12-15);

means (reference character block Baseband Processing) for processing the baseband signal Processing so as to produce an information signal encoded and modulated into the received signal (at the output of the reference character block Baseband Processing; see fig. 5),

- wherein the first receiver amplifier is common for amplifying signals received from at least two different radio interfaces (fig. 5 can share the common low noise amplifier in place of amplifiers 34b and 34d as a modified embodiment for processing receive frequency signals received from at least two different radio interfaces of the different communication systems, DCS and PCS (fig. 5; col 5, lines 25-32),

- the mixing means (in phase and quadrature mixers 40, 41; fig. 5) for generating of the complex baseband signal is common for processing signals for signals received from at

least two different radio interfaces (two different radio interfaces of the two different communication systems DCS and PCS; col 5, lines 7-19).

However, Isberg et al fail to further disclose:

second amplifier for amplifying the baseband signal,

analog-to-digital converter for converting the baseband signal digital, and

means for processing the baseband signal converted digital so as to produce an information signal encoded and modulated into the received signal.

the bandpass-filter is tunable or adjustable by means of programming.

Auvray discloses:

second amplifier (234i, 234Q; fig. 2 and hereafter) for amplifying the baseband signal (col 5, lines 33-36),

analog-to-digital converter (A/Ns 235I, 235Q) for converting the baseband signal to digital (col 5, lines 33-37); and

means for processing the baseband signal converted to digital (DSP1 24) so as to produce an information signal (23) encoded and modulated into the received signal (col 5, lines 38-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a second amplifier, an A/D converter, in order to further process the baseband signal for further amplification which strengthens the baseband signal and an A/D converter to convert the amplified baseband signal to a binary code format to represent information suitable for digital channel decoding and demodulation as suggested by Auvray (col 5, lines 38-40).

Isberg et al and Auvray do not disclose:

the bandpass-filtering is tunable or adjustable by means of programming.

Smith et al disclose the bandpass-filtering (via 117; fig. 3) is tunable or adjustable by means of programming (col 7, lines 14-17, lines 43-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the bandpass filter of Isberg et al for the tunable bandpass filter of Smith et al in order to allow the modified receiver system of Isberg et al and Auvray to reduce and simplify the circuitry components with one common bandpass filter to adjust the filter to a narrow or wide bandwidth and corresponding frequency based on the particular frequency mode in operation or the particular frequency band being received as suggested by Smith et al (col 7, lines 43-50).

Regarding claim 4, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Smith et al disclose the receiver further comprising means (103; fig. 3) for selecting the pass band of the bandpass filter (117) such that it corresponds to the receive frequency (col 7, lines 37-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the bandpass filter of the receiver system of Isberg et al and Auvray with the bandpass filter of Smith et al in order to allow receiver system to select either narrowband or wideband reception based on the particular frequency mode being in operation or the particular frequency band being received.

Regarding claim 11, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Isberg et al further disclose the signal processing path comprises

substantially the same components (the common low noise amplifier for the branch 34b and 34d sharing a single mixing circuit 40, 41 and VCO 36, LPFs 42a, 42b, and Baseband Processing for processing receive frequency signal for connecting to the different radio interfaces of the multiple mode reception of each band at BPFs 12a, 12b (see figure 5; col 5, lines 25-32).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) in view of Smith et al (US 5,796,772) as applied to claim 3 above, and further in view of Rich et al (US 5,758,271).

Regarding claim 5, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Isberg et al, Auvray, Smith et al don't further disclose the receiver further comprising means for controlling the gain of the first amplifier.
Rich et al disclose a receiver further comprising means (112 to send control signal 133; fig. 2) for controlling the gain of said first amplifier 206 (col 8, line 66 – col 9, line 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have gain control means of the first amplifier of the modified receiver system of Isberg et al, Auvray, and Smith et al in order to control the increase/decrease of the signaling power output of the radio frequency amplifier so that it will operate in the frequency mode of interest.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) in view of Smith et al (US 5,796,772) as applied to claim 3 above, and further in view of Auvray (US 5,953,641).

Regarding claim 6, Isberg et al, Auvray (US 5,564,076), and Smith et al disclose the receiver of claim 3, wherein Isberg et al, Auvray (US 5,564,076), and Smith et al don't further disclose the receiver is characterized in that the means for generating a mixing signal at the receive frequency comprises an RX synthesizer and a controllable frequency divider for dividing the frequency of the output signal generated by the RX synthesizer.

Auvray (US 5,953,641) discloses a receiver characterized in that the means for generating a mixing signal at the receive frequency comprises an RX synthesizer (SYN) and controllable frequency divider (DIV) for dividing the frequency of the output signal generated by the RX synthesizer (SYN; see fig. 1; col 4, lines 33-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a controllable frequency divider after the synthesizer output of Isberg et al and Auvray in order to change the frequencies by a factor to provide frequency channel selection and obtain the frequencies of another lower particular frequency band in use in response to the requirements of another communication system as suggested by Auvray (US 5,953,641; col 4, lines 33-40).

Regarding claim 7, Isberg et al, Auvray (US 5,564,076), Smith et al, and Auvray (US 5,953,641) disclose the receiver of claim 6, wherein Auvray (US 5,953,641) further discloses the receiver is characterized in that the frequency divider (DIV) is arranged so

as to divide the output signal of the RX synthesizer (OL) always at least by two (col 4, lines 52-55) in order to generate a RX mixing signal (OL') (see fig. 1; col 4, lines 33-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to divide by at least two in order to obtain the frequencies needed for the frequency band of the particular system in operation.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) in view of Smith et al (US 5,796,772) and further in view of Duong et al (US 5,511,235).

Regarding claim 8, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Isberg et al, Auvray, and Smith et al don't further disclose the receiver further comprising means for controlling the cut-off frequency of low-pass filtering in order to perform channel filtering to the selected radio interface. Duong et al disclose the receiver further comprising means C1, C2 into LPFs 144, 145 (fig. 1) for controlling the cut-off frequency of low-pass filtering via filters 144, 145 in order to perform channel filtering to the selected radio interface (col 3, lines 25-32; col 5, lines 8-10; col 4, lines 54-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the low pass filtering of the modified receiver system of Isberg et al, Auvray, and Smith et al in order to reduce energy leakage from strong channels which may cause erroneous measurements in adjacent channels as suggested by Duong et al (col 4, lines 59-61).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) in view of Smith et al (US 5,796,772) and further in view of Eklof (US 6,308,050).

Regarding claim 9, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Isberg et al, Auvray, and Smith et al don't further disclose the receiver further comprising means for implementing channel filtering realized in a digital manner. Eklof discloses the receiver is further comprising means 122 for implementing channel filtering realized in a digital manner (fig. 1; col 4, lines 45-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement channel filtering realized in a digital manner in the modified receiver system Isberg et al, Auvray, and Smith et al in order to extract the lowest frequency band for demodulation as suggested by Eklof (col 4, lines 45-47).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isberg et al (US 6,029,052) in view of Auvray (US 5,564,076) in view of Smith et al (US 5,796,772) and further in view of Heck et al (US 5,483,691).

Regarding claim 10, Isberg et al, Auvray, and Smith et al disclose the receiver of claim 3, wherein Isberg et al, Auvray, and Smith et al don't further disclose:

the receiver further comprising means for controlling the gain of the second amplifier. Heck et al disclose the receiver further comprising means (122, 116; fig. 1) for controlling the gain of the second amplifier (Baseband Amp 114 or 118 figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was

made to gain control the base-band amplifier of Isberg et al and Auvray in order to adjust the baseband signal to a desired level for signal processing while protecting the stages before the baseband amplifiers from overdriving while maintaining a good signal to noise ratio as suggested by Heck et al (col 3, lines 13-18).

9. Claims 2, 12, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998) and further in view of Auvray (US 5,953,641).

Regarding claim 2, Auvray discloses a method for processing signals for transmission to different radio interfaces of communication systems (system GSM DCS 1800 cellular radio and system Globalstar satellite radio; col 5, lines 3-13; col 4, lines 10-30; figs. 1 & 2), comprising steps in which:

a digital quadrature baseband signal is generated within GMSK modulator module 27 (a digital quadrature baseband signal is produced within the GMSK modulator 27 based on an input digital baseband signal 25 on the basis of the information signal to be transmitted (col 4, lines 49-51; see fig. 2 and hereafter); the digital baseband quadrature signal is converted to analog within GMSK modulator module 27 (col 4, lines 49-54);

a TX mixing signal (213i, 213Q) at a transmit frequency is generated via a TX synthesizer 215 (col 4, lines 55-63);

a carrier frequency transmission signal (218) is generated (col 4, lines 64-66) from the baseband quadrature signal (25) by mixing the digital baseband quadrature

signal with the TX mixing signal (213i, 213Q) (from synthesizer loop 214-216; col 4, lines 55-63),

the carrier frequency transmission signal generated (218) is amplified (via 217, 219; col 4, lines 64-66), and the amplified carrier-frequency transmission signal is transmitted to the radio interface via antenna 221 (col 4, lines 66-67),

the generating of the carrier-frequency signal is performed with one and same mixer (211i, 211Q; considered as one mixer splitted into in phase and quadrature components mixing for both transmission modes or bands) for signals to be transmitted to at least two different radio interfaces (col 4, lines 55-63; col 5, lines 10-13), and

the amplifying of the carrier frequency signal is performed with one and same amplifier (217) for signals to be transmitted to at least two different radio interfaces (dual band; col 4, line 64 - col 5, line 13).

Auvray doesn't specifically disclose: specific components within the GMSK modulator module for producing a digital quadrature baseband signal and to convert the digital quadrature baseband signal to analog; and

wherein the generating of a TX mixing signal at the transmit frequency comprises for at least one radio interface dividing a frequency of an output signal generated by the TX synthesizer.

Razavi discloses wherein a digital quadrature baseband signal is produced after the digital Gaussian filter produces a phase from the baseband data input to be mapped into an in phase and quadrature component, at sine ROM and cosine ROM, within the GMSK baseband pulse shaping in GMSK systems (figure 5.38, pages 150-153);

wherein the quadrature baseband signals, produced at sine ROM and cosine ROM, are fed to digital to analog converters DACs within the GMSK baseband pulse shaping system, wherein the Gaussian filter, integrator, sin ROM and cosine ROM corresponds to the GMSK modulator module 27 of Auvray and wherein the LPFs corresponds to LPFs 29i, 29Q of Auvray, and mixers with input omegaLO=omega c when there's a direct conversion system from baseband to radio frequency as in figure 5.39 of Razavi corresponds to analog subsystem 210 with analog mixers 211i and 211Q of Auvray). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the means to produce a quadrature signal and to convert the digital signal to analog within the GMSK modulator of Auvray in order to specify common specific components within a typical GMSK modulator to produce a quadrature signal more accurate digitally through a digital Gaussian filter first instead of analog and then convert the digital quadrature signal to an analog quadrature signal to analog mixers for as suggested by Razavi (page 150, lines 24-27).

Auvray (US 5,564,076) and Razavi fail to further disclose:

wherein the generating of a TX mixing signal at the transmit frequency comprises for at least one radio interface dividing a frequency of an output signal generated by the TX synthesizer. However, Auvray (US 5,953,641) discloses a method for multimode transmission wherein the generating of a TX mixing signal at the transmit frequency comprises for at least one radio interface dividing (via DIV; fig. 1) the frequency of the output signal generated by a TX synthesizer (SYN; see fig. 1; col 4, lines 33-65). Therefore, would have been obvious to one of ordinary skill in the art at the time the

invention was made to add a controllable frequency divider of Auvray (US 5,953,641) in the synthesizer of Auvray (US 5,564,076) in order to change the frequencies by a factor and channel selection to obtain the frequencies of another frequency band to respond to the requirements of another communication system as suggested by Auvray (US 5,953,641; col 4, lines 33-40).

Regarding claim 12, Auvray discloses a direct conversion transmitter operating at different radio interfaces of communication systems (system GSM DCS 1800 cellular radio and system Globalstar satellite radio; col 5, lines 3-13; col 4, lines 10-30; figs. 1 & 2), comprising:

- means (within GMSK modulator module 27) for generating a digital baseband signal on a basis of an information signal to be transmitted (based on a digital baseband signal 25 from DSP1 24; see fig. 2 and hereafter; col 4, lines 49-51);

- converting the baseband transmission signal to analog within GMSK modulator module 27 so that it outputs an analog quadrature signal 28i, 28Q to analog modulator 210 containing analog mixers 211i, 211Q; col 4, lines 49-54);

- a controllable low-pass filter (29i, 29Q) for filtering the baseband transmission signal in order to perform channel filtering according to the radio interface selected (col 4, lines 51-54),

- mixing means (211i, 211Q) for producing a signal at the carrier frequency (output signal at 217; col 4, lines 55-65) from the quadrature baseband transmission signal by means of the TX mixing signal (col 4, lines 55-63);

- an amplifier (219) for amplifying the signal at the carrier frequency (col 4, lines 64-66),

- a synthesizer (215) for generating a TX mixing signal at the transmit frequency (col 4, lines 55-63);

- antenna means (221) for transmitting the amplified transmission at the carrier frequency (col 4, lines 66-67).

- wherein the means for generating a TX mixing signal at the transmit frequency comprises a TX synthesizer (215),

- the mixing means for producing the carrier-frequency signal (211i, 211Q; considered as one mixer splitted into in phase and quadrature components mixing for both transmission modes) is common for processing signals for transmission in at least two different radio interfaces (col 4, lines 55-63; col 5, lines 10-13), and

- the transmitter amplifier (217) is common for amplifying carrier frequency signals for transmission to at least two different radio interfaces (dual band; col 4, line 64 - col 5, line 13).

Auvray doesn't specifically disclose:

- means for implementing channel filtering realized in a digital manner,
- specific means for generating a digital quadrature baseband signal and a digital to analog converter within the GMSK modulator.
- wherein the means for generating a TX mixing signal at the transmit frequency comprises a controllable frequency divider for dividing the frequency of the output signal generated by the TX synthesizer.

Razavi discloses:

- means (Gaussian filter; fig. 5.38) for implementing channel filtering realized in a digital manner,

- specific means (integrator, sine ROM and cosine ROM; see figure 5.38; pages 150-151) for generating a digital quadrature baseband signal and a digital to analog converter (DAC; figure 5.38; pages 150-151) (wherein a digital quadrature baseband signal is produced after the digital Gaussian filter produces a phase to be mapped into an in phase and quadrature component, at sine ROM and cosine ROM, within the GMSK baseband pulse shaping in GMSK systems and LPF to filter the baseband transmission signal, pages 150-151). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have specific means for generating a digital quadrature baseband signal and an analog to digital converter within the GMSK modulator of Auvray in order to output an analog quadrature baseband signal to analog mixers of Auvray by specifically producing a digital quadrature signal first from the specific cos ROM and sin ROM components of a typical GMSK modulator system of Razavi for more accuracy purposes from a digitally implemented Gaussian filter instead of analog implementation and then to convert the digital baseband quadrature signal to analog in order to convert to a transmission format recognizable by the analog mixers of Auvray.

Auvray (US 5,564,076) and Razavi fail to further disclose:

- wherein the means for generating a TX mixing signal at the transmit frequency comprises a controllable frequency divider for dividing the frequency of the output signal generated by the TX synthesizer.

However, Auvray (US 5,953,641) discloses a multimode direct conversion transmitter wherein the means (SYN, DIV) for generating a TX mixing signal at the transmit frequency comprises a controllable frequency divider (DIV) for dividing the frequency of the output signal generated by a TX synthesizer (SYN) (see fig. 1; col 4, lines 33-65). Therefore, would have been obvious to one of ordinary skill in the art at the time the invention was made to use a controllable frequency divider in order to change the frequencies by a factor and channel selection to obtain the frequencies of another frequency band to respond to the requirements of another communication system as suggested by Auvray (US 5,953,641; col 4, lines 33-40).

Regarding claim 16, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 12, wherein Auvray (US 5,953,641) further discloses the transmitter is that the frequency divider (DIV) is arranged so as to divide the TX synthesizer's output signal (OL) always at least by two in order to generate a TX mixing signal OL (col 4, lines 33-48; fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the synthesized signal at least by two to divide the mixing signal with a simple divider which cuts the synthesized signal by half to mix a lower signal with the baseband transmission signal as suggested by Auvray (US 5,953,641).

Regarding claim 20, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 12, wherein Auvray (US 5,564,076) discloses wherein the signal processing path (mixers 211, LPFs 29i, 29Q, 211i, 211Q, 216, 217, 219, 220, 215, 214, 22, 24, 27) comprises substantially the same components for connecting to the different radio interfaces for transmitting in dual mode.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998) in view of Auvray (US 5,953,641) and further in view of Igarashi et al (US 5,926,749).

Regarding claim 17, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 12 wherein Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) do not disclose the transmitter further comprising means for controlling the gain of the transmitter amplifier. Igarashi et al disclose a receiver further comprising means (VAGC through Q14) for controlling the gain of the transmitter amplifier (col 3, lines 31-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the transmitter amplifier (219) of Auvray and Razavi controlled in order to adjust the amplifier's gain to obtain the desired signal level output at the transmitting antenna.

11. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auvray (US 5,564,076) in view of Razavi (RF Microelectronics, copyright 1998) in view of Auvray (US 5,953,641) and further in view of Smith et al (US 5,796,772).

Regarding claim 18, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 12, wherein Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) don't further disclose the transmitter further comprising means for controlling the operating frequency band of the transmitter amplifier. Smith et al further disclose the transmitter is further comprising means (103) for controlling the operating frequency band of the transmitter amplifier (col 6, line 63 – col 7, line 5; fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the operating band of the transmitter amplifier (219) of the modified system of Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) in order to quickly adjust the amplifier to function in the particular band that is received as suggested by Smith (col 6, line 67 – col 7, line 2).

Regarding claim 19, Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) disclose the transmitter of claim 12, wherein Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) don't further disclose the transmitter further comprising a filter for filtering the amplified transmission signal at the carrier frequency, and means for selecting the pass band of the transmitter bandpass filter so that it corresponds to the transmission frequency. Smith et al disclose the transmitter is further comprising a filter (117) for filtering the amplified transmission signal at the carrier frequency (fig. 2; col 7, lines 5-12), and means (103) for selecting the pass band of the transmitter bandpass filter (117) so that it corresponds to the transmission frequency (fig. 2, col 7, lines 5-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a band pass filter for filtering the amplified transmission signal and

means for selecting the pass band of the band pass filter of Smith et al to the modified system of Auvray (US 5,564,076), Razavi, and Auvray (US 5,953,641) in order to transmit only a certain band of frequencies within the mode of operation and to have the to select reception of narrowband or wide band spread spectrum modulation based on the requirements of the mode in operation as suggested by Smith et al (col 7, line 3-12).

Response to Arguments

12. Applicant's arguments filed 04/21/05 with respect to claims 2, 12 and 20 have been fully considered but they are not persuasive.

Regarding the argument of the book "RF Microelectronics" by Behzad Razavi see attached paper under Product Detail Section of the book, under the publisher heading, wherein the date of November 06, 1997 indicates the book's publication date. This date is before the foreign priority date of November 26, 1998 of the application.

Regarding independent claims 1 and 3, applicant argues that the main reference, Isberg et al do not disclose or suggest common components for at least two radio interfaces. With regards to arguments related to the secondary reference, Auvray (US 5,564,076) where it does not teach a common amplifier and mixer, the secondary reference is not needed for these limitations since the main cited reference, Isberg et al, disclose the common LNA and the common mixer for the at least two different radio interfaces where in a modified embodiment the LNA could be common to both radio

interfaces (fig. 5; col 5, lines 5-32). Isberg et al do not explicitly disclose a common band pass filter. However, the modified receiver of Isberg et al and Smith et al disclose the common tuneable band pass filter which is reused to simplify the circuitry components of the receiver to adjust the bandwidth of the filter and corresponding frequency based on the particular frequency mode in operation.

Regarding independent claims 2 and 12, applicant alleges that the reference Auvray (US 5,564,076) does not discloses the added limitation of using the same mixer and amplifier for at least two radio interfaces. However, this is cited above in the rejection that the transmitter of Auvray (US 5,564,076) does have common means for mixing and amplifying. In response to applicant's argument that Auvray (US 5,564,076) does not disclose the divider of the synthesizer, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Therefore, it is well known that synthesizer contains dividers as in the modified synthesizer of Auvray (US 5,564,076) and Auvray (US 5,953,641) to divide the output of the synthesizer to set the output frequency synthesizer so that it corresponds to a selected frequency channel where it will produce a signal that will mix with digital baseband quadrature signal which can operate in another particular frequency band in use.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N Le whose telephone number is (703) 308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le

Lana Le

July 11, 2205

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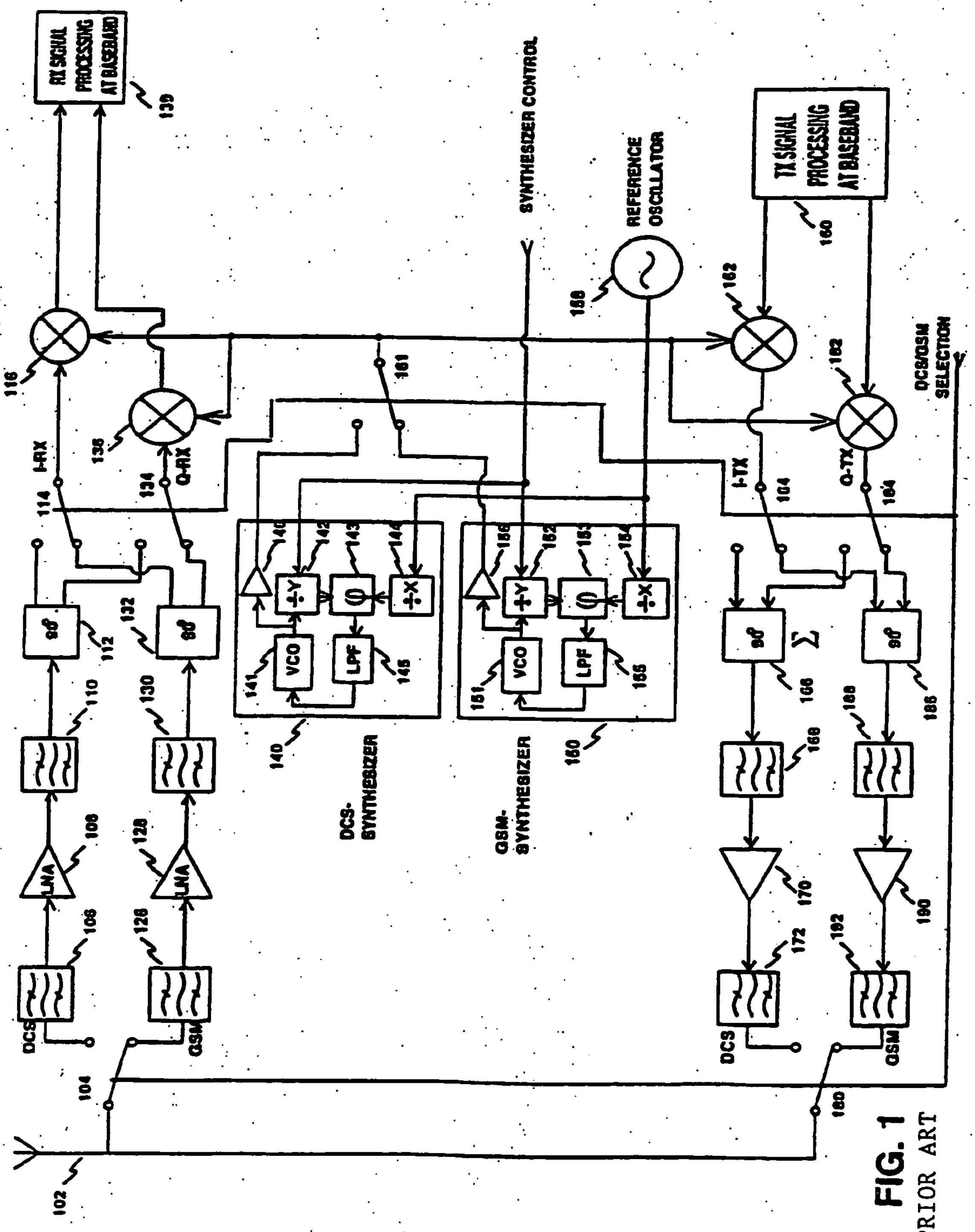
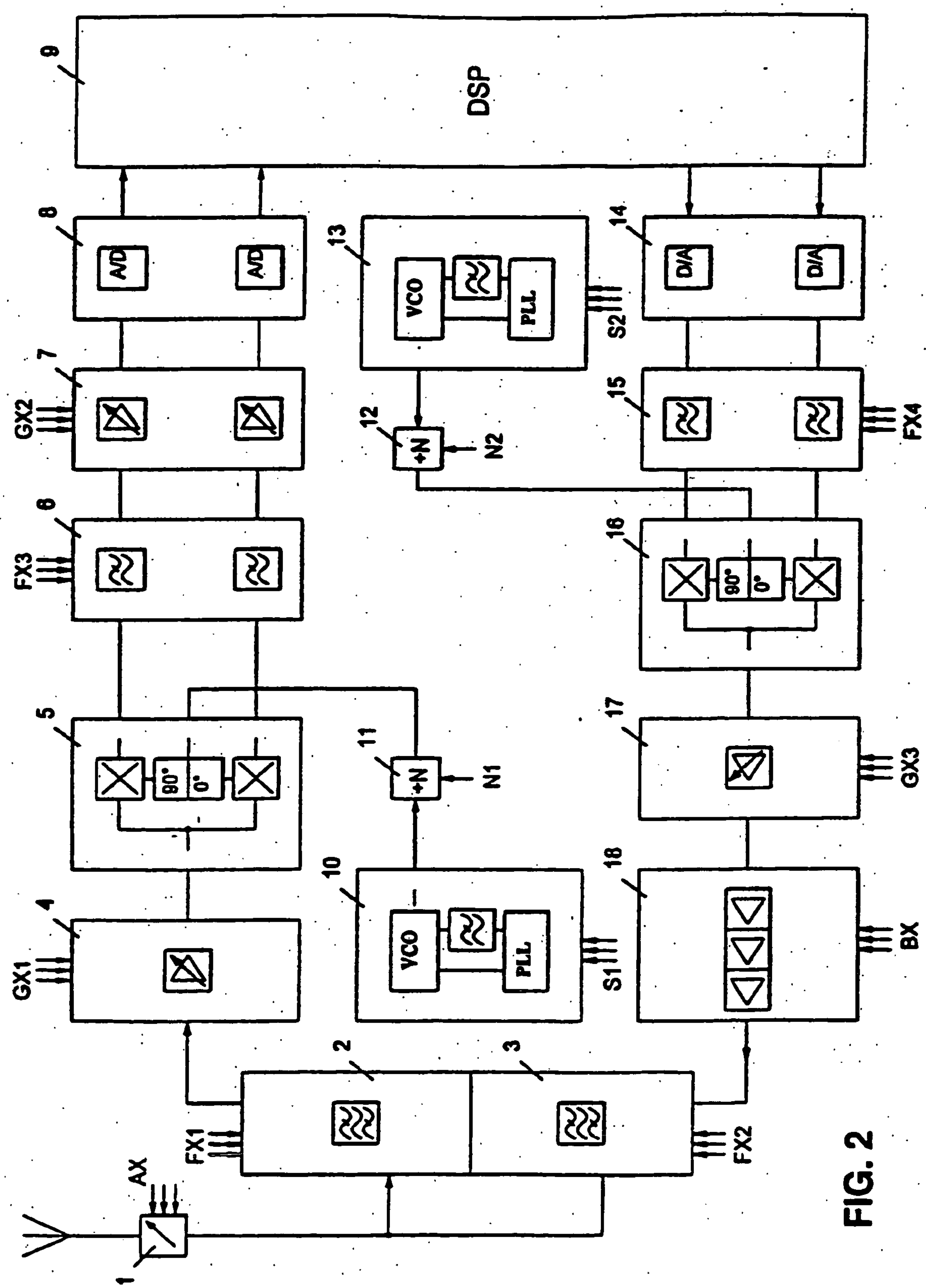


FIG. 1
PRIOR ART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9
8
A/D
A/D
13
VCO
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S2
14
D/A
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12
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N2
15
FX4
6
FX3
16
90°
0°
5
90°
0°
11
+N
N1
17
GX3
4
GX1
10
VCO
PLL
S1
18
BX
2
3
FX1
FX2
AX
1

FIG. 2